



**Canadian
Institute
of Actuaries**

**Institut
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Final Standards

Final Standards of Practice: Parts 1000 and 4000 – General Standards and Practice-Specific Standards for Actuarial Evidence

Actuarial Standards Board

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A standard actuarial method used within a model in its proper context would be considered appropriate without further justification; for example, actuarial present value method for a pension valuation and the chain ladder method and Bornhuetter-Ferguson method for unpaid claims liabilities.

1460 Quality Assurance

.01 This subsection 1460 applies to quality assurance processes that are at the instigation of the actuary responsible for the work. Such processes include quality control in the actuary's firm or employer as well as review by persons external to the actuary's firm or employer.

.02 The actuary should implement appropriate quality assurance processes prior to the release of work to users. [Effective July 1, 2019]

.03 In deciding what quality assurance processes are appropriate and proportionate, whether different processes are suitable for different elements of the work, and when the processes would be carried out, the actuary would consider the relevant circumstances, including:

- The degree of difficulty of the various elements of the work, the extent to which professional judgment is required and the overall complexity of the work;
- The purpose of the work and the extent (if any) to which the users may reasonably be expected to challenge it;
- The significance of the work, including any financial, reputational or other consequences for the users;
- The reasonable expectations of the users;
- Whether the way in which the work is carried out makes it vulnerable to errors;
- The novelty of the work and the actuary's experience in performing similar engagements; and
- Whether there are legislative or regulatory requirements for the work to be peer reviewed.

.04 Quality assurance processes include calculation control procedures and model validation, as described in subsection 1470, calculation result examination as described in subsection 1480, self-checking of the work, repetition of the work and peer review. Appropriate quality assurance processes may differ for different elements of the work.

.05 Peer review is a process by which one or more components of an actuary's work are considered by at least one other individual for the purpose of providing assurance as to the quality of the work in question. Peer review can be an important component of the quality assurance process for an actuary's work.

.06 The actuary should select a peer reviewer with the appropriate experience and expertise to perform the peer review. If a person is qualified to have performed the work to be reviewed, then that is prima facie evidence that the person is also qualified to perform the peer review. [Effective July 1, 2019]

.07 The actuary would consider to what extent any peer review should be in the form of independent peer review, whereby one or more components of an actuary's work are considered by at least one other individual who is not otherwise involved in the work in question, who has the appropriate experience and expertise to perform the peer review, and is in a position to effectively challenge the work. The perceived objectivity of a reviewer is enhanced if the reviewer is independent of the actuary performing the work.

.08 Where one or more individuals is involved in the quality assurance processes, the actuary would clarify each person's role and responsibilities.

.09 For actuarial evidence work, peer review might be precluded due to the circumstances affecting the work. The absence of peer review under such circumstances would not indicate a weakness in the quality of assurance processes applied to the work. Where the actuary is expected or required to be independent in performing the work, the scope of any peer review would be defined so as not to impair such independence.

1470 Control

.01 Control procedures that detect errors and decrease the effect of errors should be performed for calculations. [Effective February 1, 2018]

.02 To mitigate model risk, the actuary should perform model validation and employ other strategies appropriate for the financial significance of the results and the complexity of the model. [Effective January 1, 2018]

.03 A calculation that is data-intensive, that is complex, that involves physically separate steps like manual and data processing steps or parallel data processing steps, or especially, a combination of them, is prone to error that appropriate control procedures may prevent or, failing prevention, detect. Appropriate control procedures also help to meet the need for consistency between the actuary's work and other related work; for example, a uniform cut-off date in the preparation of financial statements.

4000—Actuarial Evidence

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4100 Scope

- .01 Part 1000 applies to work within the scope of this Part 4000.
- .02 The standards in Part 4000 apply to actuarial evidence work.
- .03 With respect to actuarial evidence work:
- An expert is an actuary who is qualified by knowledge, skill, experience, training or education to render an opinion or otherwise testify concerning the matter at hand; and
 - An expert opinion is a conclusion drawn from actuarial knowledge and experience or from the application of one or more actuarial methods to a body of data.
- .04 An expert opinion may be provided in a written report, oral or written testimony or both.
- .05 The provision of an expert opinion which is actuarial evidence work and which involves a practice area such as insurance or pensions is work in both that practice area and the actuarial evidence practice area. The actuary would refer to the standards applicable to that practice area, in addition to the standards in Part 4000.

Examples

- .06 Examples of actuarial evidence work are:
- Determination of the capitalized value of pecuniary losses arising as a result of an event such as personal injury, death or wrongful dismissal from employment;
 - Determination of capitalized values of pensions in marriage or common-law relationship breakdown proceedings;
 - Expert opinions given in litigation arising from work completed in respect of a pension plan or an insurance business;
 - Work as an expert advisor to a mediating official, such as a judge;
 - Determination of effective rates of interest in cases of alleged charging of criminal interest rates; and
 - Provision of an expert opinion with respect to another actuary's work that is being challenged or in cases of alleged professional negligence.

- .07 Work in a practice area, such as insurance or pensions, may be performed in an adversarial environment but not involve an anticipated expert opinion for a dispute resolution proceeding. Such work would not normally be considered to be actuarial evidence work. Examples of such work, where the standards in Part 4000 are not applicable, are:
- Pension plan valuations or costings related to union negotiations or actuarial assistance with the merger of pension plans or the valuation of a pension plan in connection with the sale of a business; and
 - Actuarial assistance with the valuation of an insurer, the merger of insurers or the acquisition of an insurer.

Fact evidence

- .08 The standards in Part 4000 do not apply to the work of an actuary who is providing only fact evidence, and not an expert opinion. For example, an actuary testifying in his or her own defense in a proceeding related to professional negligence would normally be providing fact evidence, and not an expert opinion. As another example, an actuary may be providing evidence in a dispute resolution proceeding regarding his or her involvement in work performed in a practice area such as insurance or pensions. If the circumstances were not adversarial and there was no anticipation of a dispute resolution proceeding at the time the work was performed, the actuary's evidence in the dispute resolution proceeding would normally be fact evidence and not an expert opinion. The standards in Part 4000 would apply, however, if the actuary's role includes providing an expert opinion in a dispute resolution proceeding, where such opinion is expected or required to be independent.

Litigation advice

- .09 The terms of an appropriate engagement may require that the actuary provide only litigation advice, other than an expert opinion that is expected or required to be independent, such as assisting counsel or a client in identifying and analyzing legal or actuarial issues, advising in connection with relevant case law and preparing for cross-examination of opposing witnesses. In such cases, provided that the actuary makes it clear that the work product does not represent an expert opinion that is actuarial evidence work, the standards in Part 4000 would not apply.
- .10 The terms of an appropriate engagement may require that the actuary provide both litigation advice that is not actuarial evidence work and also an expert opinion. If work related to the expert opinion meets the definition of actuarial evidence work, then the standards in Part 4000 would apply to that aspect of the engagement.

4200 General

4210 Circumstances affecting the work

- .01 When performing actuarial evidence work, the actuary should take into account the circumstances affecting the work. [Effective January 1, 2023]
- .02 The circumstances affecting the work would include:
- relevant legislative or regulatory provisions;
 - rules of civil procedure and rules of court in the relevant jurisdictions;
 - other rules that may be applicable to the dispute resolution proceeding;
 - established legal principles relevant to the work; and
 - terms of an appropriate engagement under which the work is being performed.
- .03 Relevant legislative or regulatory provisions may include:
- provisions relating to allowable pecuniary damages under automobile insurance legislation or regulations;
 - provisions related to valuation of assets under a marital property act or regulations; and
 - provisions relating to pensions, benefits, insurance or workers' compensation.
- .04 Rules of civil procedure and rules of court, as well as other rules that may be applicable to the dispute resolution proceeding, may include:
- mandated assumptions;
 - required content and format of reports;
 - role of experts; and
 - duties and obligations of experts.
- .05 Established legal principles relevant to the work may address:
- issues relevant to the actuary's engagement; and
 - role and obligations of experts.
- .06 The terms of an appropriate engagement would define the role of the actuary and the purpose, context and scope of the work. An engagement for actuarial evidence work would not be appropriate if it would impair the ability of the actuary to perform independent and objective work.

- .07 Significant terms of an appropriate engagement may stipulate one or more of:
- assumptions to be used in the actuary's work;
 - methods to be used in the actuary's work; and
 - various scenarios to be considered by the actuary.
- .08 An engagement may be appropriate if its terms require that the actuary assist his or her client or counsel with challenging the application or a particular interpretation of existing law, regulation, court practice or established legal principles relevant to the work. Nothing in Part 4000 is intended to prevent the actuary from assisting with a challenge of the application or a particular interpretation of existing law, regulation, court practice or established legal principles relevant to the work, even if the result of such challenge of the application or a particular interpretation would otherwise, in the opinion of the actuary, be inconsistent with accepted actuarial practice.

4220 Financial interest of the actuary

- .01 The amount of the actuary's compensation should not be related to the outcome of the matter (e.g., dispute resolution proceeding) in connection with which the work is done. [Effective January 1, 2023]
- .02 For example, contingency fees that depend on the outcome of the dispute resolution proceeding would not be appropriate.

4230 Role as expert

- .01 The actuary's actuarial evidence work should be independent and objective. [Effective January 1, 2023]
- .02 The actuary's role as an expert should be to assist the court or other entity in the dispute resolution proceeding in its search for truth and justice, and the actuary should not be an advocate for one side of the matter in dispute. [Effective January 1, 2023]
- .03 Where the terms of the engagement require that the actuary provide both litigation advice that is not actuarial evidence work and also an expert opinion that is actuarial evidence work, the litigation advice role should not influence the independence and objectivity of such expert opinion. [Effective January 1, 2023]

- .04 Where the actuary is providing both litigation advice that is not actuarial evidence work and an expert opinion that is actuarial evidence work, the actuary would have a clear understanding of the differences between the two roles included in the engagement. The actuary would clearly identify in any work product which component of the engagement is involved, and would ensure that the litigation advice role does not impair his or her ability to perform the actuarial evidence work.

4240 Testimony

- .01 The actuary's testimony should be independent, objective, and responsive. [Effective January 1, 2023]
- .02 Where the terms of the engagement require that the actuary provide both litigation advice that is not actuarial evidence work and also an expert opinion that is actuarial evidence work, the actuary should be aware that full disclosure of all work and work products with respect to both roles within the engagement may be required in any testimony. [Effective January 1, 2023]
- .03 In the course of providing testimony in the dispute resolution proceeding, the actuary should:
- present a balanced view of the factors surrounding the actuarial aspects of the questions put to him or her;
 - answer all the questions that are asked on the basis of his or her own best assessment of all the relevant factors;
 - apply best efforts to ensure that the evidence is clear and complete, that the information the actuary is providing will not be misunderstood or misinterpreted, and that the audience will be able to utilize it correctly; and
 - indicate when a particular issue or question falls outside his or her expertise. [Effective January 1, 2023]
- .04 The actuary should respond truthfully and fully to questions posed in the course of providing testimony, but the actuary need not volunteer information which is beyond the scope of the question posed. [Effective January 1, 2023]

- .05 Testimony is the actuary's communication presented in the capacity of an expert witness in any dispute resolution proceeding where the actuary is examined or cross-examined. Such testimony may be oral or written, direct or responsive, formal or informal.
- .06 When responding to a direct question relating to any error or shortcoming the actuary perceives in the report of another actuary or expert witness, the actuary would respond truthfully and fully, notwithstanding paragraph 4710.08.

4250 Capitalized values

- .01 The actuary should calculate the capitalized value of future amounts payable in respect of an individual utilizing the actuarial present value method. [Effective January 1, 2023]
- .02 Actuarial evidence work frequently deals with the determination of the capitalized value of amounts for purposes of a dispute resolution proceeding. These amounts are often payable in respect of an individual and sometimes in respect of a group of individuals. Such calculations must often be performed within a framework established by law, regulation, and/or legal precedent.
- .03 Payment of the capitalized value is an alternative to payment of defined amounts to which an individual is entitled. Often the courts and others have recourse to require payment of a capitalized value when payment of the defined amounts comprising that value is not practical or not desired.
- .04 Calculation of the capitalized value is within the domain of actuarial practice.
- .05 The actuary would not calculate the capitalized value of future amounts that are subject to any contingent event as the present value of an annuity certain. For example, when utilizing the actuarial present value method in respect of a life annuity, the capitalized value of each life annuity payment is weighted by the probability of survival to the date of that payment. Under this method, the present value of possible overcompensation in an individual circumstance is balanced by the present value of possible undercompensation.

4260 Assumptions and methods

- .01 The actuary should ensure that any assumptions stipulated by the terms of the engagement are plausible. [Effective January 1, 2023]
- .02 The assumptions and methods used by the actuary should take account of the circumstances affecting the work, including applicable law, regulation, court practice and established legal principles relevant to the work. [Effective January 1, 2023]
- .03 The assumptions and methods selected by the actuary should not be influenced by the party to the dispute resolution proceeding that has retained the actuary. [Effective January 1, 2023]

4270 Application of law

- .01 In a situation where law, regulation, court practice, or established legal principles relevant to the work mandates that a method or assumption be adopted in an actuarial evidence calculation, a broad interpretation of accepted actuarial practice in Canada is appropriate, so that in most such situations the law, regulation, court practice or established legal principles relevant to the work would be considered to be within the range of accepted actuarial practice in Canada.

- .02 Where an assumption is mandated by law, regulation, court practice or established legal principles relevant to the work, such assumption may be outside of the range of assumptions that the actuary considers to be reasonable.

4300 Actuarial Evidence Calculations, Other than Capitalized Value of Pension Plan Benefits for a Relationship Breakdown and Criminal Rate of Interest

4310 Scope

- .01 The standards in section 4300 apply to an actuary's advice when performing actuarial evidence calculations, other than for the capitalized value of pension plan benefits for a relationship breakdown and for a criminal rate of interest.

4320 Assumptions and methods

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| <p>.01 The assumptions and methods selected by the <u>actuary</u> should be appropriate in the aggregate, taking into account the purpose of the <u>work</u> and the parts of the standards that are applicable to the <u>actuary's work</u>. [Effective January 1, 2023]</p> <p>.02 The assumptions selected by the <u>actuary</u> should be <u>best estimate</u> assumptions, unless it is appropriate to incorporate <u>margins for adverse deviations</u> in accordance with the circumstances affecting the <u>work</u>. [Effective January 1, 2023]</p> |
|---|
- .03 Examples of the circumstances affecting the work where it would be appropriate to incorporate a margin for adverse deviations in an assumption include, but are not limited to:
- The assumption or the requirement for a margin for adverse deviations is mandated by law, regulation, court practice, or established legal principles relevant to the work; and
 - The actuary's work relates to a practice area such as insurance or pensions, and the standards for that practice area require or permit the inclusion of a margin for adverse deviations for such work.
- .04 Notwithstanding paragraph 4320.03, the terms of an appropriate engagement may stipulate assumptions that are not considered plausible by the actuary or methods that are not considered appropriate by the actuary. In such case, if the actuary performs the work in accordance with the terms of the engagement, the actuary would report the deviation from accepted actuarial practice in Canada.
- .05 The terms of the engagement may require that the actuary complete calculations for related items, such as one calculation for the capitalized value of a pecuniary loss and another calculation for the income tax gross-up. The underlying assumptions would be consistent for the calculation of these related items. In this example, the actuary would utilize the same underlying assumptions, such as the same real rate of interest, the same rate of price inflation and the same mortality assumption, for both the calculation of the capitalized value of the loss and the calculation of the income tax gross-up.

- .06 Where there are insufficient data to support a particular assumption regarding a contingency incorporated in the actuary's work, the actuary may present a range of results.

4330 Contingencies

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| <p>.01 The <u>actuary</u> should consider incorporating any contingency where, in the <u>actuary's opinion</u>, there are adequate legal, theoretical or empirical grounds to justify this. The <u>actuary</u> should disclose the omission from the <u>work</u> of any contingencies he or she considers material. [Effective December 31, 2013]</p> <p>.02 If the <u>actuary</u> gives advice on the effect of a specific contingency, that advice should be based on an assessment of that contingency, both alone and in combination with other factors, using appropriate actuarial methods. [Effective December 31, 2013]</p> |
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- .03 Where the actuary has prepared results under more than one scenario, the actuary's report would show the results of the actuarial calculations separately for each scenario and identify which contingencies have been incorporated in each scenario. For example, the results of the actuarial calculations under one scenario may include precise recognition of only net investment return and mortality. The results taking into account any other provision for contingencies would be prepared under another scenario and would be reported separately.
- .04 Recognition of a contingency may create a positive or negative effect on a calculation.

4400 Capitalized Value of Amounts Other than Pension Plan Benefits for a Relationship Breakdown

4410 Scope

- .01 The standards in Section 4400 apply to an actuary's advice when calculating the capitalized value of amounts other than pension plan benefits for a relationship breakdown. A capitalized value relates to amounts payable at various times, each amount subject to various contingencies related to the individual or to the individual's dependants. Examples of situations where capitalized values may be calculated are:

| <u>Event</u> | <u>Capitalized Value of:</u> |
|------------------------|--|
| Disability | individual's loss of earnings, loss of household services, and/or cost of extraordinary expenses attributable to the disability. |
| Death | dependant's loss of financial support and/or loss of household services. |
| Wrongful dismissal | individual's loss of earnings, pension benefits, and/or employer-sponsored benefits other than pensions. |
| Relationship breakdown | individual's support obligations. |

4420 Assumptions and methods

Past loss

- .01 In some cases, the capitalized value is the present value of amounts payable both before and after the date at which the capitalized value is established. For example, in an accident caused by negligence, litigation of the damages may result in the capitalized value becoming payable several years after the accident. Then the damages consist of those in respect of both the period before and the period after the date at which the capitalized value is established, called "past losses" and "future losses", respectively.

Income tax

- .02 Subject to the terms of the engagement, the actuary may include an appropriate allowance in the capitalized value calculation for the expected effect of income tax, taking account of applicable law, regulation, court practice and established legal principles relevant to the work. The actuary's report would deal with income tax in an internally consistent way, and the report would fully disclose the assumptions and methods utilized.

Investment expenses

- .03 Subject to the terms of the engagement, the actuary may include an appropriate allowance in the capitalized value calculation for any expenses expected with respect to the future investment, management or administration of any settlement amount, taking account of applicable law, regulation, court practice and established legal principles relevant to the work. The actuary's report would deal with such investment expenses in an internally consistent way, and the report would fully disclose the assumptions and methods utilized.

4500 Capitalized Value of Pension Plan Benefits for a Relationship Breakdown

4510 Scope

- .01 The standards in this Section 4500 apply to an actuary's advice when the capitalized value of a pension plan's benefits is needed for calculating the value of property at the breakdown of the marriage, common-law relationship or other adult interdependent relationship of a plan member.
- .02 For the purposes of this Section 4500, "plan" means "pension plan" and is broadly defined, including not only a plan that is registered under the federal *Income Tax Act* but also an unregistered plan, such as a retirement compensation arrangement and an unfunded pension plan.
- .03 The standards in this Section 4500 do not apply when the purpose of the calculation is to calculate an amount, in respect of a pension benefit, to be paid:
 - by the plan to the plan member or beneficiary as a result of the plan member's death or termination of membership; or
 - by any party in connection with litigation other than in respect of a relationship breakdown.
- .04 The standards in this Section 4500 may provide useful guidance for similar calculations for other deferred compensation arrangements, such as a partnership retirement buy-out agreement, a sick leave buy-out plan, and a retirement lump sum allowance, but they do not provide useful guidance for current compensation arrangements such as group life and disability insurance.
- .05 The standards in this Section 4500 do not apply when applicable legislation mandates a different basis for the calculation of the value of a pension for family property purposes at the breakdown of the marriage, common-law relationship or other adult interdependent relationship of a plan member.

4520 Method

- .01 The benefits to be valued are the plan's benefits in respect of the member (including survivor benefits vested in the member's spouse) at the calculation date or calculation dates. [Effective January 1, 2023]
- .02 The value of the member's benefits is the capitalized value of the benefits to be valued, but assuming that the member has no spouse. The value of the survivor benefits vested in the member's spouse is the excess, if any, of the capitalized value of the benefits to be valued over the value of the member's benefits. [Effective January 1, 2023]

Principle

- .03 The capitalized value would conform to the intent of applicable family law. The capitalized value may, thus, differ from the corresponding transfer value from a registered pension plan. Transfer values typically include only unconditional rights, whereas property under family law typically includes both vested and contingent rights. Thus, such contingent rights as early retirement rights, bridging benefits, and ad hoc inflation adjustments are property to be considered in a calculation for relationship breakdown purposes.
- .04 The standards in this section will often produce more than one result, by taking account of alternative possibilities for:
- pension commencement age;
 - future increases in accrued benefits before and after retirement;
 - allocation of value earned before marriage or cohabitation;
 - inclusion or exclusion of non-vested benefits; or
 - special circumstances, such as buy-back or transfer of benefits.
- .05 If the actuary has reason to believe that the plan's financial position is so weak that payment of the capitalized benefits is doubtful, then the actuary would so report, making clear that allowance for this factor could significantly reduce the present values calculated, given that such present values have been calculated assuming that the plan would meet its obligations. In making that assessment, the actuary would take into account any benefits payable under provincial pension guarantee legislation. The actuary would take into account further the extent to which plan benefits are provided through a retirement compensation arrangement and/or an unfunded pension plan.
- .06 The terms of the actuary's engagement may determine some or all of:
- the relevant law or jurisdiction;
 - the calculation date or calculation dates;
 - retirement age, but only if established as a matter of fact pursuant to an agreement of the parties or a determination by the court; and
 - inclusion or exclusion of the effect of income taxes.

Benefits to be valued

- .07 The benefits to be valued would include all of the plan's contractual benefits, including pre- and post-retirement death benefits, and any contractual inflation protection and non-contractual inflation protection.

- .08 The plan member's benefits to be valued would exclude spousal survivorship benefits. Spousal survivor benefits would be valued if those benefits have vested upon retirement prior to the calculation date. Depending on the circumstances of the case, the actuary may provide a value for spousal survivor benefits that are conditionally vested or that vested after the calculation date. When spousal survivor benefits are valued, their value would be reported separately from the value of the plan member's pension benefits.
- .09 The form of plan benefits that would be valued would be the most favourable of any optional form available to the member with no spouse. For example, a 15-year guaranteed pension option would have a greater value than a five-year guaranteed pension option for a member with impaired mortality. However, if the applicable law disregards a particular optional form of plan benefit, then the actuary may omit that option in calculating the capitalized value.
- .10 The benefits may include or exclude any non-vested benefits. Non-vested benefits may be included in the values, or may be illustrated separately, and would be valued without discount for the possibility of future forfeiture. Separately from the illustrated values, the report may contain comments including suggestions for recognizing the contingent nature of non-vested benefits. The references in this paragraph to inclusion of values of non-vested benefits apply in jurisdictions where the inclusion of such values depends on the plan provisions applicable to a deferred vested member. In other jurisdictions, the inclusion of such values depends on the extent to which continued employment is assumed.
- .11 The capitalized values would include ancillary benefits that are provided by the plan as of the calculation date and are expected to become available to the member after the calculation date if the plan member continues as an active member of the plan, but are not available to the member as of the calculation date, such as unreduced early retirement benefits.
- .12 The actuary would disclose whether or not the benefits valued include benefits that will be provided by the plan after the calculation date and that are expected to become available to the member after the calculation date if the plan member continues as an active member of the plan, but are not available to the member as of the calculation date, for example:
- a future increase in benefits as a result of a collective bargaining agreement; or
 - a future increase in benefits as a result of an adopted plan amendment.
- .13 The benefits referred to in paragraph 4520.11 are those payable by the plan as a going concern, and not those payable on plan wind-up, if different, unless the plan has been fully wound up or partially wound up with respect to the plan member.

- .14 Where various legal interpretations for a specific question appear possible, the actuary would obtain clarification of such unclear matters from the instructing lawyer or from another authoritative source. If that is not possible, the actuary would advise that various interpretations exist, and would report the effects of these interpretations or report values that, in the actuary's opinion, are most consistent with accepted actuarial practice.

Calculation date

- .15 The calculation date may be single or multiple, depending on the circumstances and applicable law. The possibilities include:
- the date of separation;
 - the date of marriage or commencement of cohabitation;
 - the date of trial; and
 - the report date.

Applicable standards

- .16 The applicable standards are those in effect at the calculation date. If there are two or more calculation dates, the applicable standards for each calculation date are those in effect on that calculation date.

Future service

- .17 If the member's employment terminated before the calculation date and was not reinstated at the report date, then the actuary would include nothing in the capitalized value on account of assumed service after the calculation date, even if reinstatement is possible after the report date. The actuary may, however, report a useful alternative calculation that assumes reinstatement.
- .18 If the member's employment terminated between the calculation date and the report date and was not reinstated at the report date, then the actuary may, with disclosure, exclude from the capitalized value any non-vested benefits forfeited by the termination of employment.

Effect on capitalized value of minimum benefits

- .19 In calculating the capitalized value, the actuary would take account of any minimum benefit related to member contributions, for example:
- the so-called "50% minimum employer contribution rule"; and
 - a minimum benefit equal to the member's contributions accumulated with interest.
- .20 The minimum benefit would not necessarily be limited only to the value determined on a termination of employment assumption. The capitalized value would incorporate the relevant minimum benefit rule according to the event.

Effect on capitalized value of salary increases after the calculation date

- .21 If the pension is an earnings-related benefit, then the possibilities are:
- The capitalized value takes account of all the member's salary increases—general increases, promotional increases and seniority increases—after the calculation date;
 - The capitalized value takes account of the member's salary increases that result from general (as opposed to promotional and seniority) salary increases after the calculation date. A rationale for this possibility is that the member's spouse has no entitlement to the effect of promotions or seniority increases that the member earns after the calculation date;
 - The capitalized value does not take account of the member's salary increases after the calculation date. A rationale for this possibility is that the member's spouse has no entitlement to the effect of salary increases, which depend on the member's continued employment after the calculation date.
- .22 The assumed salary increases after the calculation date would be consistent with the average wage index assumption prescribed by paragraph 4530.12, except when there is evidence that an alternate salary increase assumption would be reasonable or the terms of an appropriate engagement require a different assumption.

Effect on capitalized value of non-contractual indexing of pensions and other benefit adjustments

- .23 In calculating the capitalized value, the actuary would assume continuance of the plan's established practice or current policy, if any, for non-contractual indexing for inflation of pensions after pension commencement age and of vested deferred pensions before pension commencement age, unless there is explicit reason not so to assume. The actuary would report:
- the established practice or current policy; and
 - the indexation assumption.
- .24 If that assumption is doubtful, then the actuary would also report the numerical effect on the capitalized value of helpful alternative assumptions.
- .25 In the case of a final or best average earnings plan, there would be no allowance made for indexing of vested deferred pensions before pension commencement age in the period for which salary increases are projected after the calculation date.

Effect on capitalized value of income tax

- .26 Income tax may be taken into account in the calculation in order to convert the before-tax value of the pension into an after-tax value. If income tax is to be taken into account, then the actuary would do so by estimating the average income tax rate during the member's retirement years based upon the member's anticipated retirement date and anticipated retirement income including accrued and projected future pension income, Canada/Quebec Pension Plan, Old Age Security, and other anticipated income in retirement. The projected retirement income would be computed in "current" dollars and would assume continuance of the tax environment at the report date or the calculation date (i.e., assuming continuation of the existing tax rates, brackets, surtaxes and clawbacks applied to the projected income in retirement expressed in "current" dollars). The actuary would disclose which date was used. If the tax environment is as at the report date, the actuary would disclose the use of any tax provisions that have not yet been enacted. If income tax is taken into account, the actuary would disclose both the before-tax value and the after-tax value of the pension.
- .27 The actuary may report useful alternative calculations that take income tax into account.

4530 Assumptions

- .01 The actuary should select all assumptions, except those depending upon interpretation of applicable law. [Effective January 1, 2023]

Mortality rates

- .02 The actuary should assume mortality rates in accordance with a mortality table promulgated from time to time by the Actuarial Standards Board for the purpose of these calculations, modified, if appropriate, to reflect the member's or the member's spouse's impaired health, if medically determinable. [Effective January 1, 2023]
- .03 Tobacco use (or lack of tobacco use) would not, in itself, be sufficient reason to modify the mortality rates identified above.
- .04 Use of unisex mortality rates would not be appropriate except that it may be appropriate in situations where the plan member has terminated employment and has elected, or has the option to elect, a transfer value that was or would be calculated under a unisex basis.

Retirement age

- .05 If the retirement age is a matter of fact (i.e., one agreed by the parties or determined by the court), then the actuary would report the selection of the assumed retirement age as such.
- .06 The retirement of the member before the report date does not necessarily preclude assumption of a different retirement age.

.07 Unless paragraph 4530.05 applies, the actuary would usually assume and report the results for a range of useful retirement ages, based on data at the calculation date, which would include:

- The earliest age at which the member is entitled to a pension whose amount is not reduced on account of early retirement, assuming that the member’s service ceases at the calculation date;
- The earliest age at which the member is entitled to a pension whose amount is not reduced on account of early retirement, assuming that the member continues in service either to that age or to an earlier age after the calculation date;
- If there is an upper limit to the number of years of credited service, the earliest age at which the member has attained, or will attain, that upper limit and becomes entitled to a pension whose amount is not reduced on account of early retirement; and
- The normal retirement age.

Economic assumptions

.08 The actuary should select economic assumptions that depend on the reported rates for the applicable CANSIM series for the calendar month immediately preceding the month in which the calculation date falls. [Effective January 1, 2023]

.09 The actuary should determine from the CANSIM series the following four factors:

| CANSIM Series | Description | Factor |
|---------------------------|--|--------|
| V122487 | average long (>10 yrs) Government of Canada bond yields (final Wednesday of month) | G_L |
| V122544 | long-term Government of Canada benchmark bond yield, annualized (final Wednesday of month) | b_L |
| V122553 | long-term Government of Canada real return bond yield, annualized (final Wednesday of month) | r_L |
| $(1 + b_L)/(1 + r_L) - 1$ | break-even inflation rate | BEIR |

Note that the factors determined above do not reflect the reported CANSIM series, but the annualized value of the reported figure. [Effective January 1, 2023]

Inflation and indexing

- .10 The actuary should calculate the projected benefit obligation for a pension that is fully indexed to increases in the consumer price index using an assumed inflation rate of EI. For pensions that are partially indexed to increases in the consumer price index, the actuary should derive inflation rates in a like manner by applying to the stipulated inflation rates the partial indexing formula of the plan. [Effective January 1, 2023]
- .11 The actuary should determine the assumed rate of inflation EI as:
- First 20 years $EI_{0-20} = BEIR$
 - After 20 years $EI_{20+} = 2.0\%$
- EI should be rounded to the nearest multiple of 0.01%. [Effective January 1, 2023]
- .12 Where increases in pensions are related to increases in the average wage index or where increases in salaries are assumed to occur in line with the average wage index, the actuary should assume that the average wage index will increase at rates that are 0.75% higher than EI. [Effective January 1, 2023]
- .13 The capitalized value of a fully- or partially-indexed pension should be at least equal to the capitalized value applicable to a non-indexed pension in the same amount and having similar characteristics. [Effective January 1, 2023]
- .14 Where the plan so provides, the indexing in any of the above arrangements may be modified by:
- applying a maximum or minimum annual increase, with or without carry forward of excesses or deficiencies to later years; or
 - prohibiting a decrease in a year where the application of the formula would otherwise cause a decrease.
- The actuary would then adjust the expected inflation rate for a year to reflect the probability and extent of modification for that year.
- .15 If the pension is indexed using an “excess investment return” approach, the expected indexation rate would be determined using the “floor rate” and the interest rates determined in accordance with paragraph 4530.18 to produce an expected indexation rate consistent with excess interest situations.
- .16 For a pension in a plan that has a policy or a history of indexing on an ad hoc basis, the actuary would determine an indexation rate consistent with the indexing policy or history.

Interest rates

.17 The actuary should calculate two interest rates, one applicable to the first 20 years following the calculation date, and the second one applicable to all years thereafter. [Effective January 1, 2023]

.18 The actuary should determine the interest rates as:

- First 20 years $i_{0-20} = G_L + 0.50\%$
- After 20 years $i_{20+} = 4.75\%$

Prior to calculating the capitalized value, the actuary should round the rate of interest for the first 20 years determined in accordance with this paragraph to the nearest multiple of 0.1%. [Effective January 1, 2023]

.19 The actuary should calculate the capitalized value of a pension using a two-tier interest rate of:

- i_{0-20} for the first 20 years; and
- i_{20+} thereafter. [Effective January 1, 2023]

Target pension arrangements

.20 A target pension arrangement is a pension plan for which applicable legislation contemplates the reduction to the accrued pensions of plan members and beneficiaries while the pension plan is ongoing as one of the available options for maintaining the funded status of the pension plan, and where the reduction in accrued pensions is not necessarily caused by the financial distress of the plan sponsor or sponsors, as contemplated in paragraph 4520.05.

.21 The actuary should disclose that the pension is from a target pension arrangement. If the actuary believes that the target pension arrangement, based on the funded status and structure of the pension plan, results in pension benefits that are much less secure than pension benefits from a pension plan which is not a target pension arrangement, the actuary should so disclose. [Effective January 1, 2023]

.22 If the actuary is aware that an adjustment to the target benefits in a target pension arrangement has occurred after the calculation date, either to accrued pensions or conditionally granted ancillary benefits, or has reason to believe that an adjustment to the target benefits in the target pension arrangement is likely to occur in the future, the actuary would so report.

- .23 For a target benefit arrangement, when possible based on the data available and when useful given the nature of the of target benefit arrangement, the actuary would assume and report the results for a range of useful scenarios, which may include:
- Value of pension benefits based on the current target benefits of the pension plan, including conditionally granted ancillary benefits.
 - Value of pension benefits excluding or partially excluding ancillary benefits which are conditionally granted on an ongoing basis based on the funded status of the plan.
 - Value of pension benefits assuming adjustments to target benefits in the future, based on actual changes to target benefits after the calculation date, based on the funded status of the pension plan or other factors the actuary feels are relevant.
 - Value of pension benefits based on the current target benefits of the pension plan, including conditionally granted ancillary benefits, adjusted by the funded ratio of the pension plan. The funded ratio of the plan used to determine the adjustment would usually be based on the most recent funding actuarial valuation report or cost certificate that is publicly available at the calculation date or at the report date. The actuary would use judgment when deciding which funded ratio to use in this scenario and may apply adjustments to the funded ratio. For example, the actuary may consider it appropriate to apply adjustments to the funded ratio to exclude any provision for adverse deviations in the assumptions used to determine the funded ratio and include any part of the plan assets not included in the calculation of the funded ratio. The actuary would provide details on any adjustments applied to the funded ratio of the pension plan and the rationale for such adjustments.

Assumptions selected by client

- .24 The actuary would obtain instructions from the client with respect to assumptions dependent upon the interpretation of applicable law.
- .25 The actuary would report his or her reliance on an assumption selected by the client.

4540 Reporting: external user report

- .01 Here is model text if the actuary reports without reservation with regard to relationship breakdown:

I have determined the capitalized value of the pension benefits and prepared this report in accordance with accepted actuarial practice in Canada, for purposes of an equalization of family property resulting from relationship breakdown under the [Family Law Act] of [province]. In my opinion, the capitalized values are appropriate for this purpose.

Respectfully submitted,

[actuary]

Fellow, Canadian Institute of Actuaries

4600 Calculation of Criminal Rate of Interest

4610 Scope

- .01 The standards in Section 4600 apply to an actuary's advice when determining whether the interest rate for a particular agreement or arrangement is a "criminal rate".
- .02 The *Criminal Code* of Canada defines "criminal rate" as meaning an effective annual rate of interest calculated in accordance with generally accepted actuarial practices and principles that exceeds 60 per cent on the credit advanced under an agreement or arrangement.

4620 Data

- .01 The actuary should ascertain or make assumptions regarding the quantum and timing of all amounts actually or deemed to be advanced as well as all amounts actually or deemed to be repaid either as principal or as "interest" as defined in the *Criminal Code*. [Effective December 31, 2013]
 - .02 The actuary should report all data used in the calculation, and their sources. [Effective February 1, 2018]
- .03 If data are not clear from the initial terms of the engagement, the actuary would obtain clarification from his or her client (for example, whether or not a particular item falls within the statutory definition of "interest," which party is the lender and which is the borrower, and/or the timing of a particular payment that could be made on various alternate dates).

4630 Method

- .01 The actuary should calculate and report the effective rate of interest compounded annually, "i", such that the following equality is established:

$$\sum_{r=1}^m A_r \times (1+i)^{t_r} = \sum_{s=1}^n B_s \times (1+i)^{t_s}$$

where

- m is the total number of payments advanced by the lender to the borrower;
- n is the total number of payments repaid by the borrower to the lender;
- A_r is the amount of the r^{th} payment advanced by the lender;
- B_s is the amount of the s^{th} payment repaid by the borrower, consisting of principal, "interest" as defined, or a combination of both;

- t_r is the period measured in years (including fractional parts of a year) between the time that the r^{th} payment is advanced by the lender to the borrower and the time on which the final repayment is made by the borrower to the lender; and
- t_s is the period measured in years (including fractional parts of a year) between the time that the s^{th} payment is repaid by the borrower to the lender and the time on which the final payment is made by the borrower to the lender. [Effective January 1, 2023]

- .02 If the calculation produces only one result, then the actuary would report that result. If the calculation produces more than one result, then the actuary would report only those that are positive and real, or zero.
- .03 The formula in paragraph 4630.01 applies in most, but not all, situations.

4700 Reporting

4710 External user report

- .01 For work pursuant to Part 4000, any external user report that is prepared should:
- Identify the person for whom the report was prepared and, if that person is acting on behalf of a party to the dispute, that party to the dispute;
 - State the effective date of the report and the effective date of any actuarial opinions and calculations in the report;
 - Describe any terms of the appropriate engagement that are material to the actuary's work, including the role of the actuary, the scope and purpose of the work, any limitations or constraints on the work and any stipulated assumptions or methods;
 - Where the actuary is aware of circumstances where the independence of his or her expert opinion may reasonably be questioned, disclose such circumstances;
 - Disclose the results of the work;
 - Describe the data, methods, and assumptions used for the work, including the terms and the amounts of the payments relevant to any calculations, for each of the scenarios presented in the report;
 - Identify the assumptions and methods that are constrained by law, regulation, court practice, or established legal principles relevant to the work;
 - Identify the differences between scenarios where the results of multiple scenarios are presented;
 - Identify any margins for adverse deviations that are included, except where the assumption or method is mandated by law, regulation, court practice, or established legal principles relevant to the work, and the rationale for inclusion of any identified margins for adverse deviations;
 - Describe every contingency that has been taken into account, and state that there may be other contingencies that could have a positive or negative effect that have not been taken into account;
 - Disclose the extent of the actuary's reliance on others;
 - List the sources of information on which the actuary has relied; and
 - Include any other information required in accordance with the rules of civil procedure, the rules of law, or other rules that may be applicable for the relevant jurisdiction. [Effective January 1, 2023]

- .02 Notwithstanding paragraph 1710.01, the actuary is not required to provide an opinion on assumptions which are stipulated by the terms of engagement provided such assumptions are plausible in accordance with paragraph 4320.03. [Effective January 1, 2023]
- .03 Notwithstanding paragraph 1710.01, the actuary is not required to provide an opinion on assumptions or methods described in paragraph 4340.01 which are within the range of accepted actuarial practice pursuant to paragraph 4340.01. [Effective January 1, 2023]
- .04 The actuary's external user report should be sufficiently detailed to enable another actuary to assess the reasonableness of the results. [Effective January 1, 2023]

- .05 The actuary would prepare any draft reports and other documentation, taking into account the potential disclosure of such documents that may be required as part of the dispute resolution proceedings.
- .06 Where the actuary reports the results of a capitalized value calculation without reservation, the disclosure wording that may be used is:

I have determined the capitalized value of those aspects of the pecuniary damages described herein and prepared this report in accordance with accepted actuarial practice in Canada. It is my opinion that the assumptions and methods for which I have taken responsibility are appropriate in the circumstances of this case and for the purpose of this report.

Respectfully submitted,

[actuary]

Fellow, Canadian Institute of Actuaries

Reporting with reservation

- .07 Reporting with reservation or stating that the reporting requirements have not been followed would not excuse an actuary from these reporting standards.
- .08 Notwithstanding paragraph 4340.01, the circumstances affecting the work may result in deviation from accepted actuarial practice in Canada. For example, the terms of the engagement may require that the actuary use an assumption that is outside of the range that the actuary considers plausible, or that the actuary use a method that the actuary considers is not appropriate, or that the actuary assist counsel with challenging a specific interpretation of the law. In such case, the actuary would disclose such deviation in the report.

New information

- .09 Notwithstanding paragraph 1420.01, where an event occurs, such as the availability of new information, after the actuary has completed his or her report, the actuary would consider the potential effect of such event on his or her work, and would advise his or her client on a timely basis, if appropriate and subject to the terms of the engagement.

Disclosure of other expert's report

- .10 The external user report need not disclose any error or shortcoming that the actuary identifies in the report of another actuary or other expert witness.

4720 Internal user report

- .01 Unless an internal user report conforms to the recommendations for an external user report, an internal user report should state that it is not to be given to an external user. [Effective January 1, 2023]

- .02 For the purpose of determining whether or not the work is in accordance with accepted actuarial practice, an internal user report continues to be an internal user report even if, in breach of the statement required by paragraph 4720.01, it is given to an external user or utilized in the dispute resolution proceeding.